EFFECT OF MONOUNSATURATED FAT IN THE DIET ON THE SERUM CAROTENOID LEVELS

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CANDIDATE DECLARATION

I certify that the thesis entitled

"Effect of monounsaturated fat in the diet on the serum carotenoid levels"

submitted for the degree of Masters of Biomedical Science (Research) is the result of my own research, except otherwise acknowledged and that this thesis in whole or in part has not been submitted for an award, including a higher degree, to any other university or institution.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS USED IN THIS THESIS

ATBC	Alpha Tocopherol Beta-carotene
BMI	Body Mass Index
BHT	Butylated Hydroxytoluene
CARET	Carotene and Retinol Efficacy Trial
CHD	Coronary Heart Disease
CI	Confidence Intervals
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVD	Cardiovascular Disease
EDTA	Ethylenediamine Tetraacetic Acid
GLM	General Linear Model
HDL	High Density Lipoprotein
HPLC	High Pressure Liquid Chromatography
LDL	Low Density Lipoprotein
MI	Myocardial Infarction
MJ	Mega Joule
MUFA	Modified fat monounsaturated fat rich diet
PBS	Phosphate Buffer Solution
PEG	Polyethylene Glycol
PUFA	Polyunsaturated Fatty Acid
RPM	Revolutions Per Minute
SD	Standard Deviation
SEM	Standard Error of Mean
SFA	Saturated Fatty Acid
SPSS	Statistical Packages for Social Scientists
TBARS	Thiobarbituric Acid Reactive Substances
VLDL	Very Low Density Lipoprotein
WHO	World Health Organisation

ABSTRACT

Epidemiological data suggest that populations with higher serum/ tissue levels of carotenoids have a lower risk of coronary heart disease (CHD), possibly due to the antioxidant capacity. Lycopene, a carotenoid mainly found in tomatoes, has been suggested to have the greatest antioxidant capacity of the carotenoids found in fruits and vegetables. Carotenoids are fat-soluble compounds and their absorption from the diet into the body may depend on the amount of dietary fat ingested.

For years there has been debate about what energy source should replace the saturated fat in the diet, to give the optimum serum lipid profile to reduce CHD risk. Studies have compared monounsaturated fat rich diets with high carbohydrate, low fat diets and have found that both diets decrease serum cholesterol and low-density lipoprotein (LDL) cholesterol levels. Results for high-density lipoprotein (HDL) cholesterol and triglycerides have been inconsistent. However, it is of interest to study the effects of different diets on lipid oxidation, as this may also influence CHD risk.

Studies have investigated the effect of different amounts of total fat on the serum levels of carotenoids especially beta-carotene and lutein, but to our knowledge no study has looked at the effect of different amounts of fats on the serum lycopene levels, and whether this could subsequently affect the oxidation of LDL *in vitro*.